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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/799,259	03/12/2004	Martin Edelmann	3081.62US01	8222
24113 7590 04/04/2007 PATTERSON, THUENTE, SKAAR & CHRISTENSEN, P.A. 4800 IDS CENTER 80 SOUTH 8TH STREET MINNEAPOLIS, MN 55402-2100			EXAMINER PINKNEY, DAWAYNE	
			ART UNIT 2873	PAPER NUMBER
SHORTENED STATUTORY PERIOD OF RESPONSE			MAIL DATE	DELIVERY MODE
3 MONTHS			04/04/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary**

Application No.

10/799,259

Applicant(s)

EDELMANN ET AL.

Examiner

DaWayne A. Pinkney

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>03/12/2004</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Priority***

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### ***Information Disclosure Statement***

2. The information disclosure statement (IDS) submitted on 03/12/2004 was considered by the examiner.

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The phrase "moving the exit pupil" is not clearly defined in the claim as to how the exit pupil is moved. For examination purposes, the phrase is interpreted to mean - the pupil optics are used to move the exit pupil.
3. Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Regarding claim 1, the phrase "foregoing" renders the claim(s) indefinite because the claim(s) include(s) elements not actually disclosed (those encompassed by "foregoing"), thereby rendering the scope of the claim(s) unascertainable. See MPEP § 2173.05(d).
4. Claim 5 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the

invention. The phrase "said control unit controlling the pupil optics as a function of said signals" renders the claim indefinite because the function of the signals is not clear and not disclosed in the claim. For examination purposes, the claim is read -- said control unit controlling the pupil optics as a result of receiving the said signals from the eye-position sensing unit--.

### *Claim Objections*

5. Claim 1 is objected to because of the following informalities: claim recites "and comprising pupil optics" (lines 2-3) term comprising should be removed because the term is not used to further define the pupil optics and the image display device is comprised of imaging optics and pupil optics. Appropriate correction is required.

### *Claim Rejections - 35 USC § 102*

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 1-9 and 16-18 are rejected under 35 U.S.C. 102(e) as being anticipated by Lewis et al. (US 2002/0167462).

Regarding **claim 1**, Lewis discloses, an image display device (Paragraph 0010, lines 1-7, Paragraph 0039, lines 1-4 and Paragraph 0040, lines 6-10) comprising imaging optics having an exit pupil (Paragraph 0010, lines 1-7 and Figs. 4 and 14), said imaging optics generating a projection of an image perceivable by an observer (Paragraph 0010, lines 1-7 and Figs. 4 and 14), and comprising pupil optics (Paragraph 0010, lines 3-4 and Claims 46 and 47), said pupil

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optics spatially multiplying the exit pupil of the imaging optics (Paragraph 0062, lines 7-13 and Fig. 15A and 15B), moving the exit pupil or a combination of the foregoing (Paragraph 0005, lines 1-13, Paragraph 0062, lines 1-4 and Claims 46 and 47).

Regarding **claim 2**, Lewis discloses, the image display device as claimed in claim 1, wherein the pupil optics are arranged following the last beam-forming surface of the imaging optics (Paragraph 0041, lines 1-4 and Fig. 4).

Regarding **claim 3**, Lewis discloses, the image display device as claimed in claim 1, wherein the pupil optics move the exit pupil in a plane extending transversely to the optical axis of the imaging optics (Paragraph 0012, lines 1-8, Paragraph 0013, lines 1-6 and Figs. 4 and 14).

Regarding **claim 4**, Lewis discloses, the image display device as claimed in claim 1, wherein the exit pupil is moved such that it tracks a movement of a pupil of an eye of the observer (Paragraph 0013, lines 1-6, Paragraph 0043, lines 20, Paragraph 0044, lines 1-9, Paragraph 0047, lines 1-25).

Regarding **claim 5**, Lewis discloses, the image display device as claimed in claim 1, comprising an eye-position sensing unit and a control unit, said eye-position sensing unit sensing the position of an eye of the observer and emitting signals which represent the sensed position, and said control unit controlling the pupil optics as a function of said signals in order to make the exit pupil track the movement of the eye pupil of the observer (Paragraph 0013, lines 1-6, Paragraph 0043, lines 20, Paragraph 0044, lines 1-9, Paragraph 0047, lines 1-25).

Regarding **claim 6**, Lewis discloses, the image display device as claimed in claim 1, wherein the pupil optics comprise at least one actuator unit (Paragraph 0064, lines 16-19).

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Regarding **claim 7**, Lewis discloses, the image display device as claimed in claim 6, wherein the actuator unit comprises a galvanometer mirror (Paragraph 0064, lines 16-19).

Regarding **claim 8**, Lewis discloses, the image display device as claimed in claim 1, wherein the pupil optics for spatial multiplication of the exit pupil contain at least one diffractive element (Paragraph 0062, lines 1-4, Claim 47 and Fig. 14).

Regarding **claim 9**, Lewis discloses, the image display device as claimed in claim 8, wherein the diffractive element comprises a transmissive element (Paragraph 0062, lines 1-4, Claim 47 and Fig. 14).

Regarding **claim 16**, Lewis discloses, the image display device as claimed in claim 1, wherein the pupil optics cause a spatial multiplication of the exit pupil such that the corresponding rays from the individual exit pupils are parallel to one another (Paragraph 0063, lines 1-10, Figs. 15A and 15B).

Regarding **claim 17**, Lewis discloses, the image display device as claimed in claim 1, wherein the pupil optics cause a spatial multiplication of the exit pupil such that the individual exit pupils cover a continuous area (Paragraph 0063, lines 1-10, Figs. 15A and 15B).

Regarding **claim 18**, Lewis discloses, the image display device as claimed in claim 1, further comprising a head mounted display device and a controllable image-generating module (Paragraph 0003, lines 1-7, Paragraph 0038, lines 1-13, and Paragraph 0040, lines 6-10).

### ***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

10. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lewis et al. (US 2002/0167462) as applied to claim 1 above, and further in view of Larussa (US 6, 163, 408).

The cited primary reference, Larussa, remains as applied to **claim 1 above**.

The cited primary reference does not teach the pupil optics for spatial multiplication of the exit pupil comprises at least one birefringent element.

The added secondary reference, Larussa teaches, the pupil optics for spatial multiplication of the exit pupil comprises at least one birefringent element (Column 8, lines 15-17 and 50 of Fig. 7) for the benefit of this allows the exit pupil of the device to be large enough to accommodate head motions and/or body motions (Column 2, lines 5-8).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the birefringent element of Larussa with the device of Lewis because the birefringent element of Larussa allows the exit pupil of the device to be large enough to accommodate head motions and/or body motions (Column 2, lines 5-8).

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11. Claims 11-12 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lewis et al. (US 2002/0167462) as applied to claim 8 above.

The cited primary reference, Lewis, remains as applied to claim 8 above.

The cited primary reference does not teach that the element for moving the exit pupil is moved or is rotated about the optical axis of the imaging optics.

However, it would have been obvious to one of ordinary skill in the art at time the invention was made to move or rotate the element for moving the exit pupil about the optical axis of the imaging optics because it is known to one of ordinary skill that moving or rotating the element about the optical axis improves the quality of the image the observer sees (i.e. speckle reduction).

Regarding **claim 15**, it would have been obvious to one of ordinary skill in the art at the time the invention was made that a rotating diffraction element functions as a beam-offsetting element.

12. Claims 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lewis et al. (US 2002/0167462) in view of Larussa (US 6, 163, 408) as applied to claim 10 above.

The cited combination, Lewis in view of Larussa, remains as applied to claim 10 above.

The cited primary reference does not teach that the element for moving the exit pupil is moved or is rotated about the optical axis of the imaging optics.

However, it would have been obvious to one of ordinary skill in the art at time the invention was made to move or rotate the element for moving the exit pupil about the optical axis of the imaging optics because it is known to one of ordinary skill that moving or rotating the



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element about the optical axis improves the quality of the image the observer sees (i.e. speckle reduction).

### *Conclusion*

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following disclosures substantially teach an image display device with imaging optics and pupil optics:

Opitek et al. (US 3, 915, 548)

Ling (US 4, 934, 824)

Shiraishi (US 6, 704, 092)

Takagi et al. (US 2002/0051118)

Waldern et al. (US 2004/0108971)

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DaWayne A. Pinkney whose telephone number is (571) 270-1305. The examiner can normally be reached on Monday-Thurs. 8 a.m.- 4:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky Mack can be reached on (571) 272-2333. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

*Damage A. Ri*

DAP

*Scott J. Sugarman*  
**Scott J. Sugarman**  
**Primary Examiner**